

WHAT IS CLAIMED IS:

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1. A method for producing compound filters for products in the tobacco-processing industry, comprising the operational steps of:

supplying a filter tube, having a filter element in a central region of the filter tube, to a predetermined position; and

inserting predetermined portions of filtering material into the filter tube from at least a first end of the filter tube so that filter segments form in at least a first part of the filter tube.

2. The method according to claim 1; further including rotating the filter tube and inserting filtering material into a second part of the filter tube from a second end of the filter tube to form at least additional filter segments.

3. The method according to claim 1, wherein the inserting step includes inserting the filtering material successively in individual portions.

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4. The method according to claim 1, wherein the inserting step includes inserting the filtering material simultaneously, at least partially, at least as one multiple portion.

5. The method according to claim 1, wherein the inserting step includes inserting the filtering material at least partially in a vertical direction into the filter tube.

6. The method according to claim 1, wherein the inserting step includes alternately inserting granulate material and gas-permeable limiting pieces.

7. The method according to claim 2, wherein the step of inserting predetermined portions of the filtering material into the first part of the filter tube includes initially filling almost completely the first part of the filter tube with the filtering material prior to rotating the filter tube, and following the rotation step, the step of inserting the filtering material into the second part of the filter tube includes filling essentially completely the second part of the filter tube with the filtering material.

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8. The method according to claim 1, further including forming a compound filter with n-times a unit length, wherein n is a natural, even number higher than one.

9. The method according to claim 1, further comprising moving the filter tube along a predetermined conveying path on which the operational steps are carried out for the production of compound filters.

10. A compound filter produced in accordance with claim 1.

11. A method for producing compound filters for products in the tobacco-processing industry, comprising using a pre-manufactured filter tube containing a filter element in a central region of the filter tube.

12. The method according to claim 11, including producing compound filters with n-times a unit length, wherein n is a natural, even number higher than one.

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13. A filter tube for producing compound filters for products in the tobacco-processing industry, comprising:

a wrapping material section formed into a filter tube;
and
a filter element arranged in a central region of the filter tube.

14. The filter tube according to claim 13, wherein the filter element is essentially locally fixed relative to the filter tube.

15. The filter tube according to claim 14, wherein the filter element is glued to the filter tube.

Sub A1 16. An arrangement for manufacturing compound filters for products in the tobacco-processing industry, comprising:

a filter tube feeding element;
least
at one processing station one of which comprises a rotating device for rotating filter tubes; and
at least one conveyor into which filter tubes are deposited from the feeding element for supplying the filter tubes to the at least one processing station.

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17. The arrangement according to claim 16, wherein the filter tubes are pre-manufactured wrapping material sections formed into tubes and containing a filter element arranged in a central region of each respective section.

18. The arrangement according to claim 16, wherein the at least one conveyor comprises a continuously circulating conveyor in which the filter tubes are conveyed cross-axially.

19. The arrangement according to claim 16, wherein the at least one conveyor comprises a single conveyor and the at least one processing station is arranged on the single conveyor.

20. The arrangement according to claim 16, wherein the at least one conveyor comprises a plurality of conveyors and at least one of the processing stations is assigned to some of the conveyors and maximally one processing station is assigned to other conveyors.

21. The arrangement according to claim 20, wherein maximally one processing station is assigned to each conveyor.

22. The arrangement according to claim 16, wherein one of the processing stations comprises at least one filtering material feeding station.

23. The arrangement according to claim 16, wherein one of the processing stations comprises at least one filtering material insertion station.

24. The arrangement according to claim 16, wherein one of the processing stations comprises at least one removal station.

25. The arrangement according to claim 16, wherein one of the processing stations comprises at least one heating station.

26. The arrangement according to claim 22, wherein the at least one filtering material feeding station comprises two off-center arranged rotating discs that are respectively provided with bores, with the bores of one disc and the bores of the other disc being arranged so as to be aligned at one location.

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27. The arrangement according to claim 22, wherein the at least one filtering material feeding station comprises at least one sliding element provided with bores.

28. The arrangement according to claim 22, wherein the at least one filtering material feeding station comprises at least one lever element provided with bores.

29. The arrangement according to claim 23, wherein the at least one filtering material insertion station comprises at least one first transfer means for inserting filtering material into the filter tubes.

30. The arrangement according to claim 29, wherein the at least one filtering material insertion station includes at least one second transfer means that functions from the opposite end of the filter tube as a counter stop to the at least one first transfer means.

31. The arrangement according to claim 26, further including means for axially aligning the at least one filter tube with at least one of the bores.

32. The arrangement according to claim 31, wherein the axial aligning means is for aligning at least two of the bores with the filter tube.

33. A compound filter-manufacturing system for products in the tobacco-processing industry, comprising:

a filter tube feeding device;

a system for conveying filter tubes supplied by the filter tube feeding device along a predetermined movement path; and

an arrangement for rotating the filter tubes disposed on the conveying system.

34. The compound filter-manufacturing system according to claim 33, wherein the conveying system comprises at least one continuously circulating conveyor for conveying the filter tubes cross-axially.

35. The compound filter-manufacturing system according to claim 34, further comprising at least one processing station associated with the at least one conveyor.

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35. The compound filter-manufacturing system according to claim 34, wherein the at least one conveyor is a single conveyor.

36. The compound filter-manufacturing system according to claim 34, wherein the at least one conveyor comprises a plurality of conveyors, each conveyor being associated with one of (a) at least one processing station and (b) no processing station.

37. The compound filter-manufacturing system according to claim 34, wherein the at least one conveyor comprises a plurality of conveyors and no more than one processing station is associated with each conveyor.

Sub 38. A method for producing multiple unit ~~length~~ filters for products in the tobacco-processing industry, comprising the following operational steps:

supplying a filter tube to a predetermined position;
and

inserting predetermined portions of filtering material into the filter tube, said inserting step including inserting at least two portions of the filtering material into the filter tube during one operational step.

39. The method according to claim 38, wherein the filter tube has ^{at least} one end and said inserting step includes filling the filter tube from only ~~the~~ one end.

40. The method according to claim 38, wherein the filter tube has two opposing ends and the inserting step includes filling the filter tube from the two opposing ends.

41. The method according to claim 40, further including rotating the filter tube so that it can be filled from the two opposing ends.

42. The method according to claim 40, wherein the supplying step includes supplying the filter tube with a filter element in a central region of the filter tube.

43. The method according to claim 38, wherein the supplying step includes transporting the filter tube at least in part cross-axially along a predetermined movement path for filling the tube.

44. The method according to claim 38, wherein the inserting step includes inserting the filtering material with a vertical movement component.

45. The method according to claim 38, further including producing the filter tube in a step preceding the supplying step.

46. The method according to claim 38, wherein the inserting step includes alternately inserting filtering material segments comprising, respectively, granulate-containing material and gas-permeable limiting pieces.

Sub A3) 47. The method according to claim 38, including producing a multiple unit ~~length~~ filter of ~~n units length~~, wherein n is a natural, even number higher than 1.

Sub B3) 48. A multiple unit length filter produced according to the method of claim 38.

49. An apparatus for producing multiple unit length filters for products in the tobacco-processing industry, comprising:

a filter-tube feeding element;

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at least one conveyor into which filter tubes are insertable from the feeding element; and

at least one processing station for being supplied with the filter tubes by the at least one conveyor, wherein at least one of the processing stations is a filtering materials insertion station including means for inserting two portions of filtering materials into a filter tube in a single operational step.

Sub E1 50. The apparatus according to claim 49, wherein one of the processing stations comprises a rotating mechanism for rotating the filter tubes.

51. The apparatus according to claim 49, wherein the at least one conveyor comprises at least one continuously circulating conveyor which conveys the filter tubes cross-axially.

52. The apparatus according to claim 49, wherein the at least one conveyor comprises a single conveyor and at least one of the processing stations is arranged on the single conveyor.

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53. The apparatus according to claim 49, wherein the at least one conveyor comprises a plurality of conveyors and at least one processing station is associated with each of the conveyors.

54. The apparatus according to claim 49, wherein a maximum of one processing station is associated with each of the conveyors.

55. The apparatus according to claim 49, wherein the at least one conveyor comprises multiple conveyors, one of the conveyors being associated with at least one processing station and at least one of the conveyors being associated with only one of the processing stations.

56. The apparatus according to claim 49, wherein at least one of the processing stations comprises a filtering material feeding station that includes two rotating and eccentrically arranged discs that are respectively provided with bores, with the bores of one disc and the bores of the other disc being positioned so that they are aligned at one location.



57. The apparatus according to claim 56, including means for arranging at least one filter tube so that it is axially aligned with at least two bores. 

58. The apparatus according to claim 49, wherein at least one of the processing stations includes a filtering material feeding station comprising at least one of (a) at least one pusher element provided with bores and (b) at least one lever element provided with bores.

59. The apparatus according to claim 49, wherein the filter tube has one end and said means for inserting comprises at least a first transfer means for inserting the at least two portions of the filtering materials in a single operational step into the one end of the filter tube.

60. The apparatus according to claim 59, wherein the filter tube has another end opposite the one end, and the first transfer means comprises at least one first plunger and the filtering material insertion station includes at least one second transfer means for proving at the opposite end of the filter tube a counter support to the at least one first plunger.

Sub A4) 61. A multiple unit ~~length~~ filter manufacturing system for products in the tobacco-processing industry, comprising:

a filter-tube feeding apparatus;

a conveying system for conveying filter tubes supplied by the filter-tube feeding apparatus along a predetermined movement path; and

at least one processing station receiving filter tubes from the conveying system, said at least one processing station including at least processing station for inserting at least two portions of filtering materials into at least one filter tube during one operational step.

Sub C1) 62. The filter-manufacturing system according to claim 61, wherein one of the processing stations comprises a rotating device for rotating the filter tubes.

63. The filter-manufacturing system according to claim 61, wherein the conveying system comprises at least one continuously circulating conveyor for conveying the filter tubes cross-axially.

64. The filter-manufacturing system according to claim 63, wherein at least one processing station is associated with at least one of the conveyors.

65. The filter-manufacturing system according to claim 63, wherein the at least one conveyor comprises a single conveyor and the at least one processing station is associated with the single conveyor.

66. The filter-manufacturing system according to claim 63, wherein the at least one conveyor comprises a plurality of conveyors and at most one processing station is associated with each respective conveyor.